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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
BOKHARI, SYED M	

ART UNIT	PAPER NUMBER
2609	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/713,586	BAKSHI ET AL.	
	Examiner	Art Unit	
	Syed Bokhari	2609	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *13 November 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-34* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-34* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *04/11/2005 and 11/13/2003*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

1. Claim 9, 18-19, 25 and 31 are objected to under 37 CFR 1.75 to because of the following informalities:

For claim 9 line 1, the occurrence of "an incoming packet" and "a line card" refers back to "an incoming packet" and "a line card" previously cited in line2 of claim 8, if it is true, it is suggested to applicant to change "an incoming packet" to --the incoming packet-- and "a line card" to --a line card—respectively.

For claim 18 line 4, the occurrence of "an offload portion" should be changed to --the offload portion--.

For claim 19 line 1, the occurrence of "an offload portion" should be changed to --the offload portion--.

For claim 25 line 4, the occurrence of "a control portion" should be changed to --the control portion--.

For claim 31 line 1, the occurrence of "an incoming packet" should be changed to --the incoming packet--.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 1-17 and 30-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shenoy et al. (US 2003/0223425 A1) in view of Deval et al. (Distributed Control Plane Architecture for Network Elements).

Claims 1-7:

For claim 1, Shenoy et al. discloses a system, comprising a control card, comprising (see paragraph 0016 lines 3-4 on page 2 in Detailed Description); a

control processor to execute a control portion of an exterior gateway protocol (see paragraph 0018 lines 1-3 on page 2 in Detailed Description); a routing table of exterior gateway routes and devices (see paragraph 0017 lines 4-9 on page 2 in Detailed Description); a line card, comprising (see paragraph 0016 lines 5-6 on page 2 in Detailed Description); line processor to execute an offload portion of an exterior gateway protocol (see paragraph 0020 lines 10-12 on page 2 in Detailed Description) and a communications port to allow termination of at least one communication link (see paragraph 0020 lines 1-6 on page 2 in Detailed Description). Shenoy et al. teaches all the subject matter of the above claimed invention with the exception of :

- A backplane to allow the control card and the line card to communicate as recited in claim 1.
- The control processor further comprising a general-purpose processor as recited in claim 2.
- The control processor further comprising an Intel Architecture processor as recited in claim 3.
- The line processor further comprising a network-enabled processor as recited in claim 4.
- The line processor further comprising an Intel IXP processor as recited in claim 5.
- The backplane further comprising a physical backplane connection as recited in claim 6.

- The backplane further comprising a network as recited in claim 7

Deval et al. from the same or similar field of endeavor teaches above limitations:

For claim 1, a backplane to allow the control card and the line card to communicate (see left column lines 1-2 and figure 2 on page 3).

For claim 2, the control processor further comprising a general-purpose processor (see right column lines 30-32 on page 1).

For claim 3, the control processor further comprising an Intel Architecture processor (see right column lines 10-12 on page 6).

For claim 4, the line processor further comprising a network-enabled processor (see right column lines 11-13 on page 5).

For claim 5, the line processor further comprising an Intel IXP processor (see left column lines 4-7 on page 6).

For claim 6, the backplane further comprising a physical backplane connection (see left column lines 1-4 on page 3).

For claim 7, the backplane further comprising a network (see left column lines 1-4 on page 3).

It would have been obvious to one of ordinary skill in the art at the time of invention was made to use the same backplane for interconnection of control card and the line card as taught by Deval et al. in the distributed architecture of Shenoy et al. The backplane provides a wide band connection to the control card and the line card for efficient flow of traffic as taught by Deval et a. can be modified/implemented in the distributed architecture of Senoy et al. by replacing

the switch fabric with the backplane. The backplane interconnects all the blades including control cards and line cards and provides efficient means for the flow of control and data traffic between blades. Specifically for claim 1-5, a general purpose processor or a microprocessor or Intel processor can be used in place of proprietary processors as taught by Deval et al. in the distribution architect of Senoy et al. Any microprocessor performs functions such as protocol processing, packet classification and making forwarding decision.

The motivation for claims 1-7 is that by replacing the switch fabric with the backplane and the proprietary processors with general purpose microprocessor will make distributed architecture more efficient as the control module and the line card will communicate without congestion and at the same time it will be cost effective because of general purpose processors.

Claims 8-17:

For claims 8, Shenoy et al. discloses a method of processing an exterior gateway protocol packet (see paragraph 0017 lines 9-16 on page 2 in Detailed Description); receiving an incoming packet at a line-card (see paragraph 0020 lines 1-4 on page 2 in Detailed Description); Parsing the packet to extract protocol data (see paragraph 0020 lines 10-12 on page 2 in Detailed Description) and transmitting any control-relevant data to a control card (see paragraph 0035 lines 1-7 on page 4 in Detailed Description).

For claim 9, Senoy et al. teaches receiving an incoming packet at a line-card further comprising receiving a packet through the Transmission Control Protocol

(see paragraph 0028 lines 3-7 on page 3 in Detailed Description). Shenoy et al. teaches all the subject matter of the above claimed invention with the exception of:

- Determining if the packet is valid as recited in claim 8.
- Generating message traffic for peer gateways as recited in claim 8.
- Determining if the packet is valid further comprising determining if the packet is a mal-formed packet as recited in claim 10.
- Determining if the packet is valid further comprising applying a packet filter to the packets as recited in claim 11.
- Determining if the packet is valid further comprising applying an address filter to the packets as recited in claim 12.
- Transmitting any control-relevant data to a control card further comprising transmitting data related to valid updates from gateway peers as recited in claim 13.
- Parsing the packet to extract protocol data further comprising decrypting encrypted packets as recited in claim 14.
- Generating message traffic for peer gateways further comprising generating responses required by the incoming packets as recited in claim 15.
- Generating message traffic for peer gateways further comprising announcing routes to peer gateways as recited in claim 16.
- Generating message traffic for peer gateways further comprising encrypting messages for peer gateways that require encryption as recited in claim 17.

Deval et al. from the same or similar field of endeavor teaches above limitations:

For claim 8, determining if the packet is valid (see left column lines 16-18 on page 4) and generating message traffic for peer gateways (See left column lines 2-5 on page 4).

For claim 10, determining if the packet is valid further comprising determining if the packet is a mal-formed packet (see left column lines 20-24 on page 4).

For claim 11, determining if the packet is valid further comprising applying a packet filter to the packets (see right column lines 1-4 on page 11).

For claim 12, determining if the packet is valid further comprising applying an address filter to the packets (see right column lines 19-31 on page 4).

For claim 13, transmitting any control-relevant data to a control card further comprising transmitting data related to valid updates from gateway peers (see left column lines 2-5 on page 4

For claim 14, parsing the packet to extract protocol data further comprising decrypting encrypted packets (see right column lines 17-19 on page 11).

For claim 15, generating message traffic for peer gateways further comprising generating responses required by the incoming packets (see right column lines 5-11 and lines 23-25 on page 3)

For claim 16, generating message traffic for peer gateways further comprising announcing routes to peer gateways (see left column lines 3-8 on page 2).

For claim 17, generating message traffic for peer gateways further comprising encrypting messages for peer gateways that require encryption (see left column lines 27-28 and right column lines 1-3 on page 6).

It would have been obvious to a person of ordinary skill at the time of invention was made to combine the methods of generating message traffic to peer gateways, authentication mechanism to verify the valid node, the packet filtering and data encryption as taught by Deval et al. in the distributed architecture of Shenoy et al. The message generation to peers, authentication mechanism, packet filtering, and encryption as taught by Deval et al. can be modified/implemented in the distributed architecture of Shenoy et al. by enabling the part of the protocol on control plane processor for processing packet filtering, authentication, validation of packets and encryption. The message generation to peers gateway is one of the functions of BGP protocol whereas the authentication, filtering and encryption functions are important from security point of view to avoid unwanted traffic to get into the distributed architecture and also to protect it from the cyber attacks of the hackers. The motivation for implementing the part of the protocol in the control module processor is to enable the functions of for generating message traffic to peer gateways, packet validation, packet filtering and data encryption.

Claims 30-34:

For claims 30, Shenoy et al. discloses an article of machine-readable code containing instructions that, when executed, cause the machine to (see paragraph 0018 lines 3-12 on page 2 in Detailed Description); receiving an incoming packet at a line-card (see paragraph 0020 lines 1-4 on page 2 in Detailed Description); Parsing the packet to extract protocol data (see paragraph 0020 lines 10-12 on page 2 in Detailed Description) and transmitting any control-relevant data to a control card (see paragraph 0035 lines 1-7 on page 4 in Detailed Description).

For claim 31, Shenoy et al. teaches the instructions causing the machine to receive an incoming packet at a line-card further cause the machine to receive a packet through the Transmission Control Protocol (see paragraph 0028 lines 3-7 on page 3 in Detailed Description). Shenoy et al. teaches all the subject matter of the above claimed invention with the exception of:

- Determining if the packet is valid as recited in claim 30.
- Generating message traffic for peer gateways as recited in claim 30.
- The instruction causing the machine to determine if the packet is valid further cause the machine to determine if the packet is a mal-formed packet as recited in claim 32.
- The instruction causing the machine to determine if the packet is valid further cause the machine to apply a packet filter to the packets as recited in claim 33.

- The instruction causing the machine to determine if the packet is valid further cause the machine to apply an address filter to the packets as recited in claim 34.

Deval et al. from the same or similar field of endeavor teaches above limitations:

For claim 30, determining if the packet is valid (see left column lines 16-18 on page 4) and generating message traffic for peer gateways (See left column lines 2-5 on page 4).

For claim 32, the instruction causing the machine to determine if the packet is valid further cause the machine to determine if the packet is a mal-formed packet (see left column lines 20-24 on page 4).

For claim 33, the instruction causing the machine to determine if the packet is valid further cause the machine to apply a packet filter to the packets (see right column lines 1-4 on page 11).

For claim 34, the instruction causing the machine to determine if the packet is valid further cause the machine to apply an address filter to the packets (see right column lines 19-31 on page 4).

It would have been obvious to a person of ordinary skill at the time of invention was made to combine the means of generating message traffic for peer gateways, authentication mechanism to verify the valid node, and the packet filtering as taught by Deval et al. in the distributed architecture of Shenoy et al. The message generation for peers, authentication mechanism, and packet filtering as taught by Deval et al. can be modified/implemented in the distributed

architecture of Shenoy et al. by installing the part of the protocol on the processor for processing of packet filtering, authentication and validation of packets. The message generation for peers gateway is one of the functions of BGP protocol whereas the authentication and filtering are important from security point of view to avoid unwanted traffic to get into the machine and to protect from the external attacks of the hackers. The motivation for implementing the protocol on the processor is to enable the means for generating message traffic for peer gateways, packet validation and packet filtering.

6. Claims 18-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Deval et al. "Distributed Control Plane Architecture for Network Elements" in view of Shenoy et al. (US 2003/0223425 A1).

Claims 18-24:

For claim 18, Deval et al. discloses a method of establishing an offload portion of a distributed exterior gateway protocol (see left column lines 43-46 on page 4); initializing a line card (see left column lines 12-19 on page 8); registering an offload portion of a protocol to be executed by the line-card with a central registration point (see right column lines 50-53 on page 7); setup a control connection with a control card (see right column lines 22-28 on page 2); receiving configuration information from the control card (see right column lines 23-25 on page 1); establishing connections with exterior gateway peers (see right column lines 47-53 on page 2); performing Border Gateway Protocol functions at the line-

card (see right column lines 19-31 on page 4) and transmitting only valid Border Gateway Protocol data to the control card (see left column lines 20-24 on page 4).

For claim 19, registering an offload portion further comprising registering with a distributed control plane architecture infrastructure module (see right column lines 50-53 on page 7).

For claim 21, performing Border Gateway Protocol functions further comprising filtering all mal-formed, illegal and duplicate update messages from peer gateways (see left column lines 43-46 on page 4).

For claim 22, performing Border Gateway Protocol functions further comprising caching a routing table received from the control card (see left column lines 3-8 on page 2).

For claim 23, performing Border Gateway Protocol functions further comprising running output policies for each peer gateways (see left column lines 24-35 on page 8)

For claim 24, performing Border Gateway Protocol functions further comprising encrypting and decrypting packets as necessary (see left column lines 27-28 and right column lines 1-3 on page 6). Deval et al. teaches all the subject matter of the above claimed invention with the exception of:

- Transmit data resource data to the control card as recited in claim 18.
- Performing Border Gateway Protocol functions further comprising parsing and validating incoming packets as recited in claim 20.

Shenoy et al. from the same or similar field of endeavor teaches above limitations:

For claim 18, transmit data resource data to the control card (see paragraph 0029 lines 12-15 on page 3 in Detailed Description)

For claim 20, performing Border Gateway Protocol functions further comprising parsing and validating incoming packets (see paragraph 0020 lines 10-12 on page 2 in Detailed Description).

It would have been obvious to one of ordinary skill in the art at the time of invention was made to use of the same method of transmitting data to control card, parsing and validating of incoming packets as taught by Shenoy et al. in the distributed architecture of Deval et al. The line card processor functions of communicating with control card, parsing and validating packets as taught by Shnenoy et al. can be modified/implemented in the distributed architecture of Deval et al. by programming the processors line card. The microprocessors when programmed perform parsing validation of packets and sending data to control card. The motivation for adding the functions to the lines cards processor is for sending data to control card, parsing and validating of packets.

Claims 25-29:

For claim 25, Deval et al. discloses a method of establishing a control portion of a distributed exterior gateway protocol (see right column lines 15-17 on page 8); initializing a control card (see left column lines 12-19 on page 8); registering a control portion of a protocol to be executed by the control card with a central

registration point (see right column lines 50-53 on page 7); setting up control connections with line-cards executing offload portions of the protocol (see right column lines 4-7 on page 10) and configuring the line cards (see right column lines 23-25 on page 1).

For claim 26, configuring the line-cards further comprising providing a routing table and policy data to each line card (see left column lines 3-8 on page 2).

For claim 27, registering a control portion of a protocol to be executed further comprising registering the control portion with a distributed control plane architecture infrastructure module (see right column lines 50-53 on page 7)

For claim 28, performing central Border Gateway Protocol functions further comprising processing valid updates from the line cards and adjusting the routing table as needed (see left column lines 1-10 on page 4)

For claim 29, performing central Border Gateway Protocol functions further comprising providing an updated routing table to each line card as necessary (see left column lines 3-8 on page 2). Deval et al. teaches all the subject matter of the above claimed invention with the exception of configuring the line cards as recited in claim 25. Shenoy et al. from the same or similar field of endeavor teaches configuring the line cards (see paragraph 0017 lines 4-9 on page 2 in Detailed Description).

It would have been obvious to one of ordinary skill in the art at the time of invention was made to use the same method to control module for implementing configuration commands to the line-cards as taught by Shenoy et al. in the

distributed architecture of Deval et al. The method of implementing configuration commands to the line-cards as taught by Shenoy et al. can be modified/implemented in the distributed network of Deval et al. by implementing the function in control module processor. The protocol implementation functions of control module include configuration commands, updating forwarding information, system information etc. The motivation of implementing the configuration function to control module is for line cards to be updated for any change to the network elements.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. US 7,065,059 B1 (Zinin), US 2002/0103921 A1 (Nair et al.), US 2002/0165981 A1 (Basturk et al.), US 2003/0110289 A1 (Kamboh et al.), US 2003/0198221 A1 (Kim et al.), US 2005/0050136 (Golla) and US 2005/0074003 A1 (Ball et al.)

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Syed Bokhari whose telephone number is (571) 270-3115. The examiner can normally be reached on Monday though Friday from 7:30 AM to 5:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dang Ton can be reached on (571) 272-3171. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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SUPERVISORY PATENT EXAMINER